The EXCAVATING ENGINEER

ol. XXII APRIL 1928 No. 4

IN THIS ISSUE:

Moving 63,000,000 Cubic Yards for Welland Ship Canal.

Front Cover Illustration: Excavating Rock and Shale on Section 3, Welland Ship Canal.

No boy sent to do this Man's Size job!

Extra profits were earned by using 2-yd. and 3-yd. machines for this big excavation

300,000 *cubic yards* in the excavation of Chicago's new sewage treatment plant—one of the big holes was 400 feet long by 150 feet wide, and over 50 feet deep.

So the T. J. Forschner Contracting Co. of Chicago put in a big BUCYRUS-ERIE Dragline that took out 3 cubic yards a bite — and another with a 2-yard bucket.

If there's money in the contract — *More Speed means More Profit.*

And these big draglines work under perfect control — little finish trimming was needed on the pump house excavation, where the 3-yd. machine pulled out some 90,000 yards. A good deal of the spoil was *dumped into narrow 5-yard trailers.*

Whatever the size of machine you're using—or the type of power—the *extra strength* and *extra speed* that are built into BUCYRUS-ERIES mean *extra profits.*

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There is a BUCYRUS-ERIE to fit every class of work—a machine to do fast work and stand up to it. Shovels, Cranes and Draglines of all sizes—Gasoline, Gas +Air Diesel, Steam and Electric. Also dipper, hydraulic, elevator and placer dredges; railway cranes; spreader and ballast plows, etc. Every type and size of excavating equipment — and every machine built to the same high standard of ***Reliability.***

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Bringing the Middle West Closer to the Sea.

1 — Drill Boats in Port Colborne Harbor.
2 — Building Leaf of Service Gate in Lock No. 1.
3 — Bucyrus 41-B Loading Gravel at Port Colborne.
4 — Looking Over J. H. Corbett & Sons Operations from Boom of Bucyrus Dragline.
5 — Rock Formation Handled by Corbett's Bucyrus Class-175 Dragline.
6 — Looking Out Over Port Colborne Harbor; End of Breakwater and Drill Boats in Distance.
7 — View on One of the Abandoned Canals.
8 — Dipper Dredge "Chas. Boone."
9 — Building Underpass for Chippewa Creek.
10 — Pouring Breakwater on Lake Erie.
11 — Northern Construction Company Operations Showing Bucyrus 320-B Behind Trestle with Bucyrus Class-24 on Bank.
12 — J. H. Corbett & Sons Bucyrus Class-175 Dragline Loading Cars on High Bank.
13 — Clamming Clay for Creek Underpass.
14 — Lock Construction by P. Lyall & Sons Construction Company.

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Moving 63,000,000 Cubic Yards for Welland Ship Canal

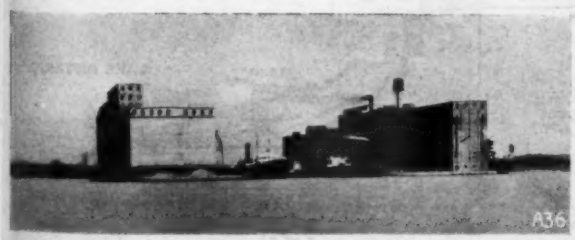
New Welland Ship Canal Now Eighty Per Cent Completed — To Be Finished in 1930

AT a total cost estimated as $115,000,000, Canada expects to complete in 1930 the new Welland Ship Canal which has been under construction since 1913. This canal will be the fourth constructed across the Niagara Peninsula to connect Lake Erie and Lake Ontario, and will permit great ocean vessels to carry cargoes between foreign ports and the cities along the United States and Canadian shores of the Great Lakes.

Lying about ten miles west of Niagara Falls, it follows the approximate route of the old canal, shortening it considerably, and having its Ontario terminal at Port Weller instead of Port Dalhousie. Its locks must raise and lower vessels 326½ feet, the difference between the levels of the two Great Lakes.

Four Relocations in One Hundred Years

The first Welland Canal, twenty-seven and one-half miles long, completed in 1829, had forty wooden locks 110 feet long by 22 feet wide, with an eight-foot depth of water on the sills.



Canadian Government Elevators at Port Colborne.

In 1845 the canal was reconstructed, reducing the number of locks to twenty-seven, and increasing the depth of water to nine feet on the sills, later increased to ten feet.

As traffic through the canal continued to increase with the development of the West, it became necessary to make further improvements and in 1882 the canal now in use was finished. This has locks 270 feet by 45 feet, originally built with a depth of twelve feet but increased in 1887 to fourteen feet.

The New Canal to Take Vessels of 25-foot Draught

The new Welland Ship Canal which is scheduled to handle traffic in 1930 is twenty-five miles long

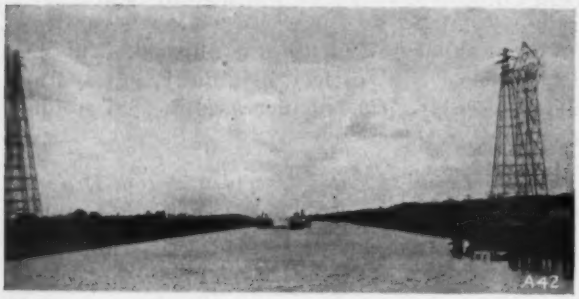
and will have but seven locks, three of which are double, enabling boats to ascend and descend at the same time. The new locks are 800 feet long by 80 feet wide and require but twenty minutes to pass a ship through. The whole time required for a loaded vessel to pass through from lake to lake will be eight hours.

The direct line of the canal down the face of the escarpment and the topography of the lower plateau permit the adoption of forty-six and one-

half foot lifts, which constitutes a peculiar feature of canal construction, having no precedent in locks of this size. The depth for the present will be twenty-five feet, but the project has been planned so that this may be increased to thirty feet by simply dredging out the canal reaches between the locks. The canal is built 200 feet wide at the bottom with two to one slopes on the sides.

Use Old Canal Channels for Power Plants

When one realizes that this is the fourth relocation of the canal one wonders what was done with the old canals. Because of the great drop or head of water the abandoned canals became the logical sites for many mills and power plants using the water power available. A great many of these small and comparatively inefficient plants have



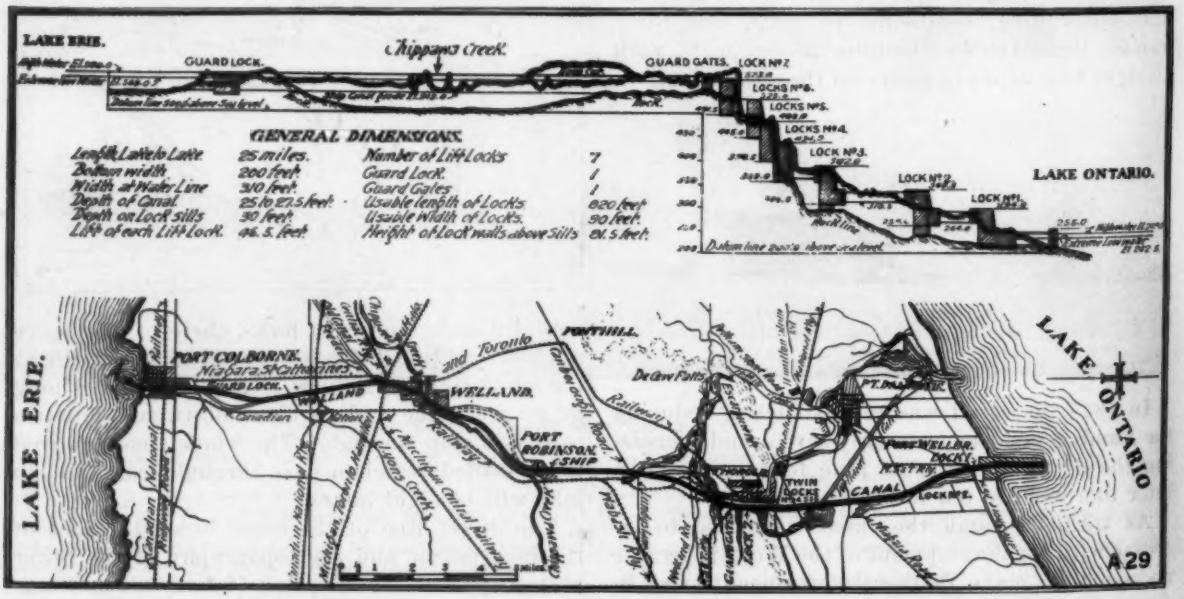
Deep Cut on Section 5 from Allanburg Bridge. The New Canal Follows the Old Canal Here, Hence You See the Vessels Passing Working Dredges.

now been abandoned because of inability to compete with the cheaper power available from the Ontario Hydro Electric Commission development on the Niagara River.

At the present writing, the new canal is eighty

Erecting Lower East Leaf of Service Gates on Lock No. 2. The Size May Be Estimated from Men Working on Top of This Leaf.

per cent completed. The dry land excavation has been practically finished and the bulk of the remaining work is dredging. A remarkable feature of the construction is that it has all been done without interruption to the regular traffic through the present canal, which, in 1927, exceeded 7,000,000 tons. In places the old and new canals come so close together that water seepage through the rock has made the work extremely difficult,



and has cost the contractors many thousands of dollars for keeping the pits dry.

With the completion of the dry land digging, the new ditch will be flooded and dredges brought in to dig away the few remaining portions at the intersections between the old and new canals. After the barriers have been dredged away the old canal will be blocked and the new canal ready for traffic.

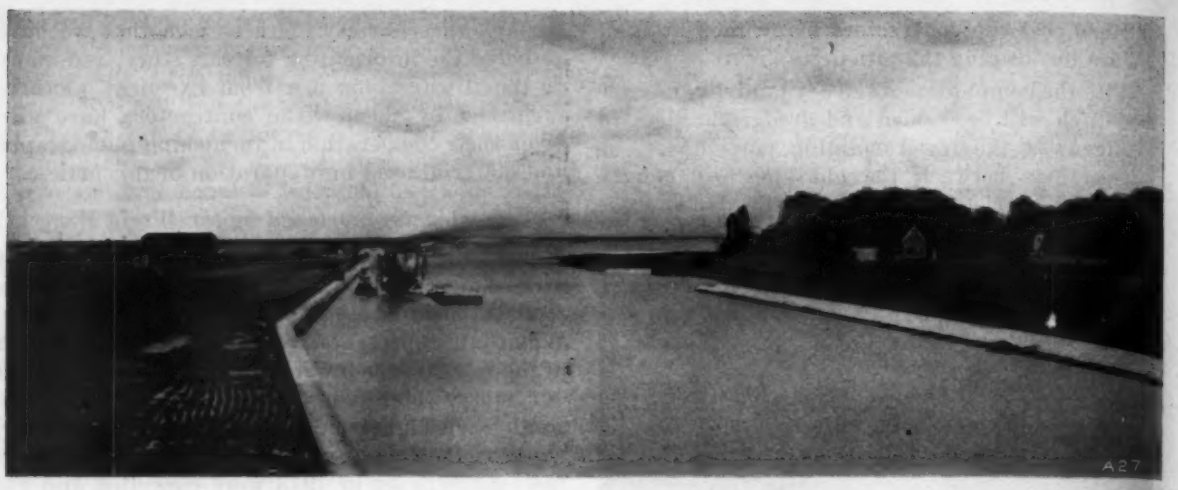
Removing Old Wabash Span. Compare Widths of Old and New Canal Channels.

Alex J. Grant is Chief Engineer of the canal construction for the Canadian Government and E. G. Cameron is Assistant Engineer. It is partly through the courtesy of these men that we have gathered the information for this story, and many of the illustrations are from excellent pictures furnished by them. The contractors have also given their co-operation in furnishing photographs and material used in preparation of this article.

Construction Delayed by the World War

The work on the new canal has stretched out over so many years (since 1913) that it is impractical to include a history of earlier operations. When our representative visited the canal much of the work on the lower end had been finished and our story, therefore, deals principally with the southern or higher end. In 1916, owing to the war, work on the canal practically ceased, and in 1918 the contracts let in 1913 were cancelled and the work entirely closed down. After the armistice in November 1918, the Canadian Government decided to resume work on a small scale and arranged with the original contractors for resumption of work on their former contracts for Sections 1, 2, 3 and 5. From January, 1919, the work was carried on under a cost plus arrangement — in a more or less intermittent manner, due to labor trouble and other causes — until 1921 and 1922 when the cost plus percentage contracts were cancelled, and the remaining work was relet under unit price contracts. It is with these later contracts that the present article deals.

J. P. Porter's 5-yard Dragline. The Use of Timbers for Dragline Trackage Is Interesting.

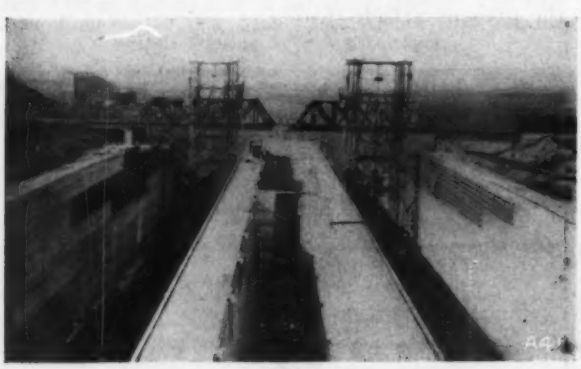


The New Lower Entrance and Harbour at Port Wellor on Lake Ontario. This End of Canal Now Practically Completed.

The Work Involved Includes 63,000,000 Cubic Yards Excavation

The principal items of work involved are:

Rock excavation	8,700,000 cubic yards
Earth excavation	49,000,000 cubic yards
Water-tight embankments..	5,400,000 cubic yards
Concrete (all classes).....	3,400,000 cubic yards
Reinforcing steel	25,500,000 pounds
Steel sheet piling.....	32,000,000 pounds



Twin Locks No. 4 Looking North from Lock No. 5.

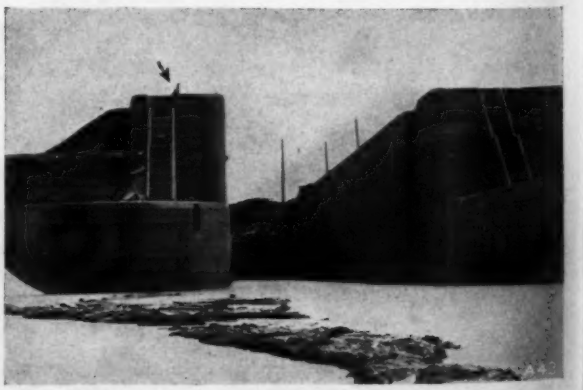
Sections Nos. 1, 2 and 3 Practically Completed Handling Plastic Blue Clay a Problem

For the purposes of construction the Canal has been divided into eight sections. Section No. 1 is at the Northern, or Lake Ontario, end, and Section No. 8 at the Southern, or Lake Erie, end.

Sections Nos. 1, 2, and 3 contain the seven lift locks, and the work on these sections is now about 94 per cent completed. Of these Sections Nos. 1 and 2 are under the supervision of F. C. Jewett, division engineer, and under contract to J. P. Porter & Sons. These two sections included about 7,000,000 cubic yards of earth excavation and about 800,000 cubic yards of concrete.

A Bucyrus 70-C railroad-type shovel was used on the excavation for Lock No. 1, this being one of the few places on Sections No. 1 and 2 where it was possible to work a railroad-type shovel. For the greater part of the excavation, on account of the softness of the blue plastic clay through which the canal passes, it was necessary to use draglines or large revolving shovels carried on mats. So soft and sticky was the material that it could not be removed from dump cars and flat cars with a Lidgerwood unloader, and a plow had to be used. Ordinary waste fills would not hold the locomotives and cars on the shoulder, so an apron dock was built on the lower entrance walls of the harbor at Port Colborne whence the material was plowed off the flat cars into hopper bottom scows which carried it out into the lake for dumping.

J. P. Porter & Sons purchased for their work on the canal two Bucyrus 225-B electric shovels from the Hydro-Electric Power Commission, and converted them into draglines equipped with 155-foot booms. These shovels were located on the bank of the Chippewa Power Canal. Instead of



Lock No. 3. An Idea of the Lift May Be Obtained from the Man Indicated by the Arrow.

dismantling them they were loaded on a heavy scow and transported via the Niagara River through the Black Rock Canal to Buffalo, and thence via Lake Erie to Port Colborne, at which point they entered the Welland Canal.

Concrete Construction on Twin Locks No. 4.

The trimming and sodding on these sections was sublet to Bland & Sibbald, and the concreting of slopes was sublet by the Ontario Construction Company and Aiken and Innes. On Section 2 Aiken & Innes subbed the concrete work, and J. M. Porter had a team outfit doing the grading.

Sections Nos. 3 and 4 Include Twin Locks

Sections Nos. 3 and 4, under resident engineer C. W. West, were relet as one contract to P. Lyall & Sons Construction Company, Limited. These sections include the three twin locks; Nos. 4, 5 and 6, as well as single lock No. 7.

Nos. 3 and 4 contained the following quantities:

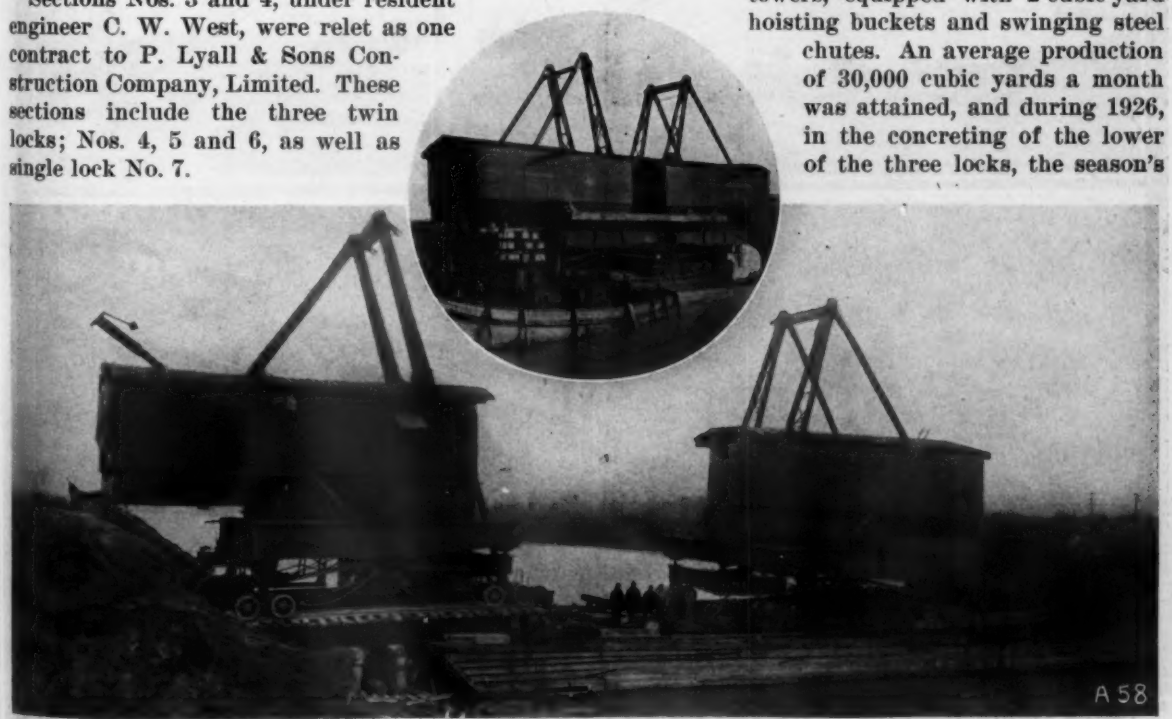
Earth excavation	5,000,000 cubic yards
Rock excavation	1,700,000 cubic yards
Water-tight embankment	720,000 cubic yards
Rock crushed	2,500,000 cubic yards
Concrete	1,440,000 cubic yards
Reinforcing steel	8,000,000 pounds

On earth excavation standard railroad-type shovels, saddle-tank locomotives, and air dump cars were used, disposal being behind the concrete structures, in water-tight embankments, and in filling up low-lying ground adjacent to the canal.

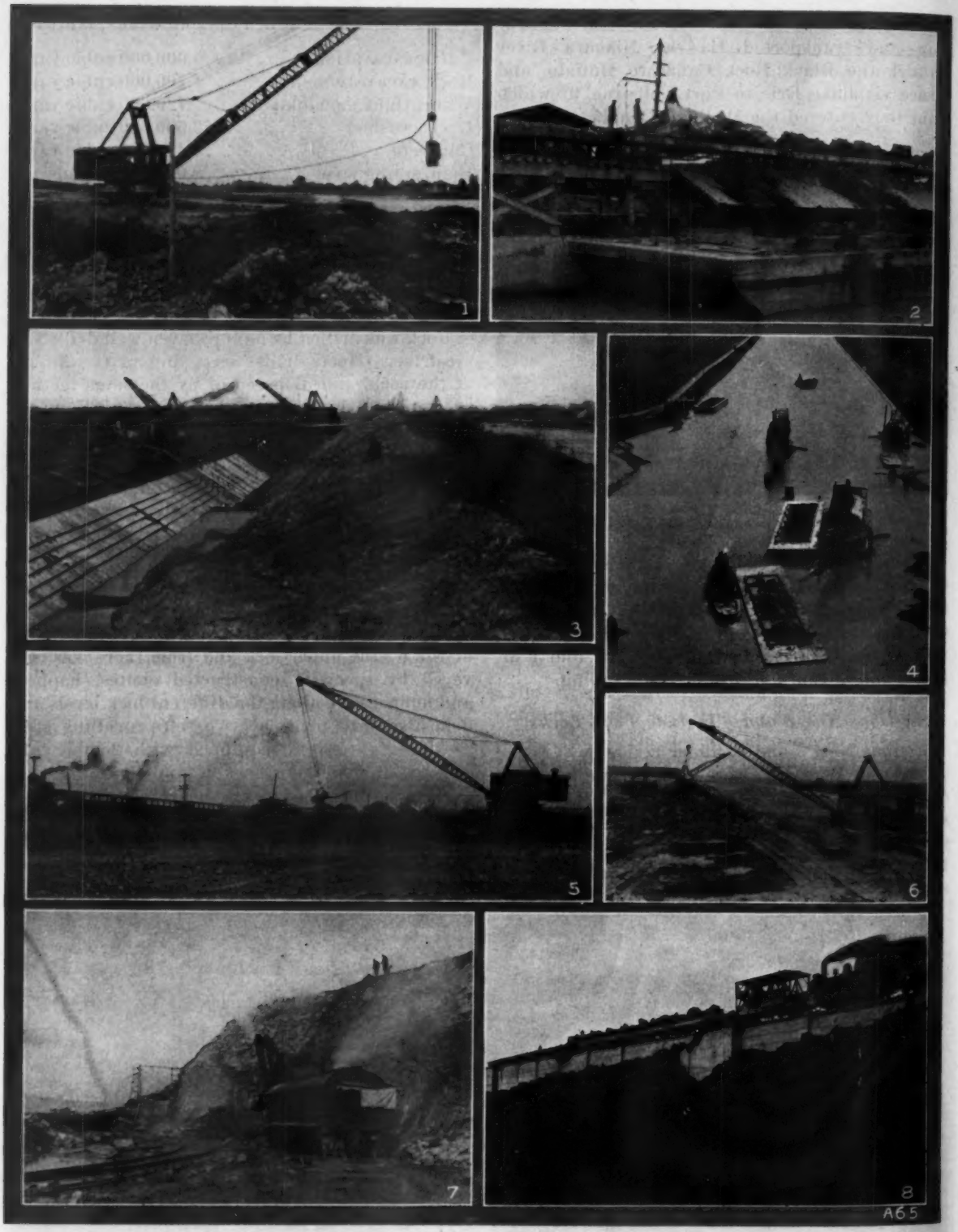
Rock was drilled by motor-driven well drills and air-driven tripod drills, according to the nature of the rock, and disposed of by the same method as employed in earth work, either as fill in the center of the lock walls or into the crusher plant.

This crusher plant consisted of a No. 42 Kennedy Gyratory Crusher, with eight secondary gyratory crushers, motor-driven, and belt conveyor system of distribution into storage piles, which at times amounted to half a million tons.

Upwards of a million cubic yards of concrete for the twin-flight locks Nos. 4, 5 and 6, was mixed by two 2-cubic-yard Ransome mixers at the head of No. 6 (the upper lock and from there was conveyed by specially constructed chutes, hoppers and hopper cars along the different lock levels and deposited into place by two self-propelling steel towers, equipped with 2-cubic-yard hoisting buckets and swinging steel chutes. An average production of 30,000 cubic yards a month was attained, and during 1926, in the concreting of the lower of the three locks, the season's



Loading J. P. Porter & Sons' Bucyrus 225-B Electrics at Montreal for Towing Over Lake Erie to the Canal Job.



Typical Excavation on the New Welland Ship Canal.

1 — One of J. P. Porter & Sons' Bucyrus 225-B Draglines Excavating Foundation for Embankments.

2 — Plowing Blue Clay into Scows for Dumping in Lake Erie. 500,000 Yards Disposed of in This Way by J. P. Porter & Sons.

3 — Section 7 Showing Concrete Wash Wall with Reade Construction Company, Limited's, Bucyrus Class-24's in Background.

4 — Canadian Dredging Company Dipper Dredge Operation; Completed Section of Canal in Background.

5 — James H. Corbett & Sons Bucyrus Class-175 7-Yard Dragline Stripping Rock on Section 7.

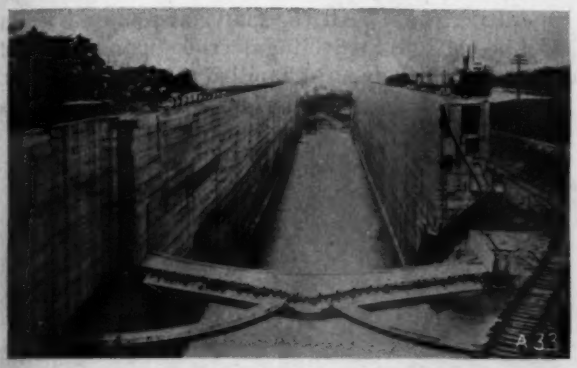
6 — Reade Construction Company, Limited, Excavating with Bucyrus Class-24 at the Right and Recasting with Sister Machine at Left.

7 — Bucyrus 70-C Excavating for Railway at Lock 1; One of the Few Places on Sections 1 and 2 Where Railroad-type Shovels Could Be Used.

8 — J. P. Porter & Sons Unloading Clay for Backfilling at Lock 2.

record was 325,000 cubic yards, and the best month, June, 55,000 cubic yards.

The following shovels were used in earth and rock excavation: one Bucyrus 103-C standard electric shovel; one Bucyrus 85-B standard steam



Looking North into Lock No. 7. Notice the Ship Going Through the Old Canal at the Right.

shovel; three Type B Erie revolving steam shovels; one Type B Erie revolving dragline; one 73 Marion-Osgood shovel; three 60 Marion shovels; one 20 Marion shovel.

Sir William Arrol & Company subbed the excavation of Lock No. 4 and the prism to the north end of Section No. 3 from P. Lyall & Sons, handling this work with a Bucyrus 85-C electric shovel.

Section No. 4-B was taken by J. P. Porter & Sons, J. M. Porter handling some of the excavation for them with a team outfit and Aiken & Innes the culvert. A Bucyrus 20-B dragline was put in on this section in December 1927 to handle earth and rock excavation.

Section No. 5 Finished by Canadian Dredging Company

Section No. 5, under resident engineer E. P. Johnson (who has charge of Sections Nos. 6 and 7 as well), was handled by the Canadian Dredging Company and was completed at the time of our

Excavating Limestone on Section No. 4.

visit. This firm also contracted Section No. 7 and moved to that location after completing Section No. 5.

Section No. 6, Port Robinson to Welland

Section No. 6 extends from Port Robinson to Welland, and was let in October, 1925, to the Atlas Construction Company of Montreal and E. O. Leahy Company for whom J. Horgan is manager.

J. P. Porter & Sons subcontracted some eight million yards of material, part of which they are

Stiff Blue Clay Was Handled by These Movable Stiff Leg Derricks in Excavating for Syphon Culvert on Section 6 to Provide Underpass for Chippewa Creek.

handling with two electric, twenty-two-inch hydraulic dredges, the Stewart and the Schuniah, built by Bucyrus Company. These two dredges worked against a hydraulic head of about 70 feet with a three to four hundred foot discharge line.

One of W. A. Black's Tractor Outfits.

J. P. Porter & Sons sublet a portion of the excavation to Broderick Bros. who are using two Class-225 Bucyrus draglines.

They also sublet 2,500,000 cubic yards of team work to the following: P. E. Shugart with two team outfits; J. M. Porter with three team outfits; Smith & Scroggy with two team outfits; and W. A. Black & Co. with two tractor-grader outfits.

Under J. P. Porter & Sons were also as subcontractors, The Ontario Construction Company, placing stone slope protection and rock filling, and Aiken & Innes, building bridge foundations and concrete slope protection.

Syphon Culvert Carries Chippewa Creek Under Canal

The Section No. 6 contract includes, as well as the above excavation, the construction of a large syphon culvert in concrete, at Welland, to carry the waters of the Chippewa Creek under the ship canal.

In the construction of this culvert the contractor has excavated inside steel sheet pile pits to a depth of seventy feet below present canal water level, with these pits immediately alongside the operating canal. All the material removed was a gumbo clay, and traveling derricks using one-yard clamshell buckets have handled all the excavation. The area of the culvert foundation taken out is approximately 200 feet wide by 400 feet long.

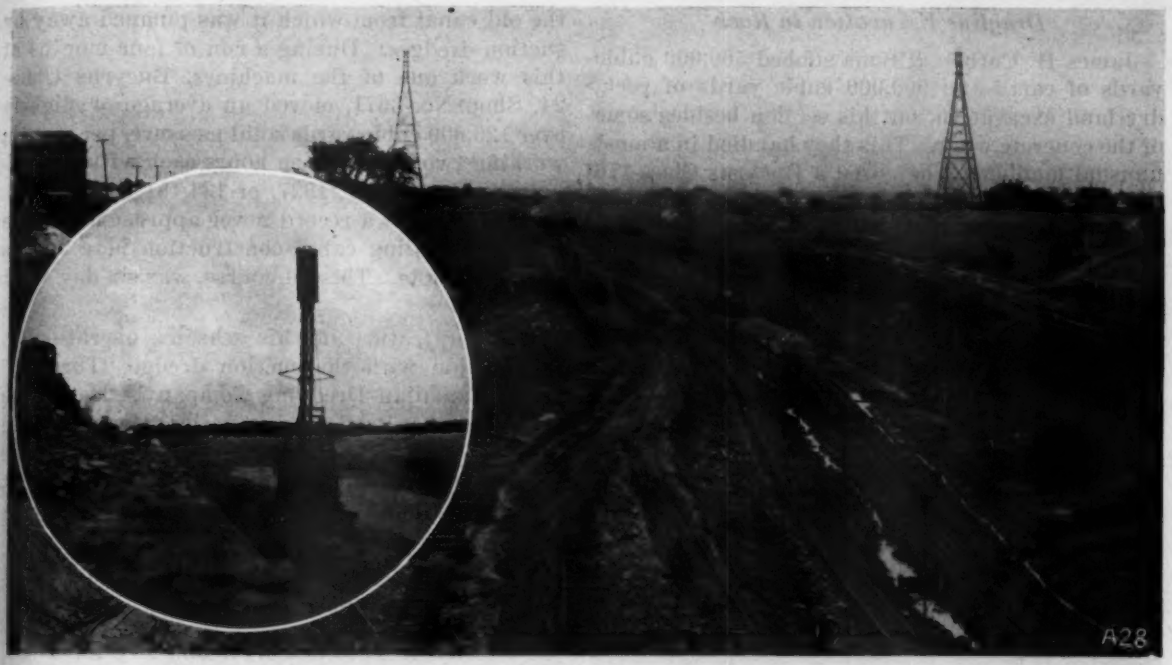
Lock No. 8 Looking South from Main Street, Humberstone.

Section No. 7 Includes Twelve Million Yards of Excavation

Section No. 7 extends from Welland to Ramsey's Bend, and was handled by the Canadian Dredging Company, who started this work in 1925. This section is now about 75 per cent completed and will be finished in 1928. The work consists of some 12,000,000 cubic yards of excavation, of which 1,500,000 cubic yards is solid rock. There is also 25,000 cubic yards of concrete slab protection, 25,000 cubic yards of rip rap and 105,000 cubic yards of concrete.

A. M. German is manager for the Canadian Dredging Company and

Left — One of the Hydraulic Dredges Belonging to the Canadian Dredge Company. Center — C. M. Sullivan Pointing Out the Ingenious Device Used for Fastening Discharge Pipes. Right — Discharge from Hydraulic Dredge. Some Idea of Size of Pipe and Flow Can Be Obtained from the Legs of Man Standing on Pipe.



Looking North from Canadian National Railway. Temporary Bridge Over Section 3. Finished Slope of Bank May Be Noticed Just Above the Type B Erie at the Right. (Insert) Bucyrus Class-175 Handling Rock Excavation on Section 7.

has on this section two hydraulic and two dipper dredges. With the hydraulics working 24 hours and the dipper dredges 16 hours a day they are able to move about 500,000 cubic yards a month. The 6-yard dipper dredges, the Excelsior and the Monarch, load into self-dumping barges of 400 cubic-yards capacity, which dump their loads three miles out in Lake Erie. The largest of the hydraulic dredges, the Tornado, is a 24-inch oil-burner having 1800 horse power on board, and is pumping through a discharge line 5,600 feet long. The others, the Primrose, is a 20-inch hydraulic. One floating rock drill is drilling through one to ten feet of rock. Other equipment consists of a 25-ton derrick, a 45-ton derrick, six tugs, a complete machine shop and a carpenter shop.

Unique Fastening of Discharge Pipes

An interesting feature of the hydraulic dredging here is the fastening together of the discharge line pipe sections by small straps of steel welded over the joints instead of the customary twisted wire. This device was originated by C. M. Sullivan, superintendent of hydraulic dredges for the Canadian Dredging Company, and has proven very successful, holding the line water-tight even when balls of clay were encountered.

Some idea of the magnitude of these dredging operations may be gained from the settling basin for one hydraulic dredge discharge which was made by building a dyke around 250 acres of land.

Hard Digging South of Canadian National Crossing at Port Colborne. Note Just Behind the Bucyrus 320-B the Vertical Rock Wall Left by the Blasting.

Dragline Excavation in Rock

James H. Corbett & Sons subbed 500,000 cubic yards of earth and 900,000 cubic yards of rock, dry land excavation, on this section besides some of the concrete work. This they handled in a most unusual manner. They used a Bucyrus Class-175 electric dragline digging with a 7-yard bucket right through the blasted rock and loading Clark 30-yard dump cars on top of the bank. Two Davenport 60-ton locomotives handled the hauling, which averaged about one and one-half miles.

Vessels Held Up at Port Colborne Harbour by Ice.

Although handling rock with a dragline is a rather unusual procedure and one not ordinarily practical, the fact remains that Corbett encountered rock that broke readily and he handled the material very cheaply. His best month was 80,000 cubic yards of rock. Air-driven power drills were used; Stephenson, Adamson and Ingersoll-Rand being represented. In addition to the dragline, two Model 60 Marions were loading gravel and cleaning the sides, digging cuts about fifteen feet wide and four feet deep. A Nordberg track shifter was used to save track labor, and Mr. Corbett speaks very enthusiastically of the work of this machine.

Dewatering a Problem

On this portion of the work dewatering was a serious problem, and was handled by eight electrically-driven centrifugal pumps made by Goldie & McCullough (two 16-inch, one 14-inch, one 12-inch, three 10-inch and one 6-inch).

This 3500 feet of ditch handled by James H. Corbett & Sons was a particularly tough job and required remarkably hard work. H. A. Corbett and E. A. Corbett were both on the job all the time.

The Reade Construction Company also subbed dry land excavation on Section No. 7 from the Canadian Dredging Company and used two Class-24 Bucyrus-Erie draglines. They handled practically all of the bank construction on Section No. 7, the distance being about 6 miles.

During 1927 they cast the material from the prism or notch in making the new bank, over into the old canal from which it was pumped away by suction dredges. During a run of four months at this work one of the machines, Bucyrus Class-24, Shop No. 3671, moved an average of slightly over 125,000 cubic yards solid measure, per month, working two shifts of ten hours each with a maximum in September, 1927, of 134,481 cubic yards. This constitutes a record never approached in the figures recording canal construction here and is worthy of note. This, of course, was six-day week operation.

Another feature of this season's operation in conjunction with the suction dredge "Tornado" of the Canadian Dredging Company's fleet is the fact that the Reade Construction Company did not have an hour's delay charged to them for the entire season of 1927, a tribute, says D. B. Tees, president of the company, both to the Bucyrus machine and the efficiency of its operation.

Bridge foundations on this section were sublet to Cameron & Phinn.

Section No. 8, Submarine and Dry Land Excavation

Section No. 8 extending the canal to Lake Erie and including the spur to the Western breakwater, is under Geo. Kydd, resident engineer, and

Nordberg Track Shifter on Corbett's Work.

was contracted to A. W. Robinson, Limited, of Montreal. These people sublet the entire dry land section to the Northern Construction Company, Limited, and Stewart & Welch, while the dredging was let to C. S. Boone Dredging and Construction Company of Toronto, and the cribbing to Kilmer & Barber also of Toronto. Creelman & Company of Winnipeg subbed the concrete work on the land section.

This section consists mainly of the harbor and upper lock — a control lock to keep the water in the canal at the proper level. Here a 2,000-foot breakwater was built at a cost of about a million

Bucyrus 320-B Handling Hard Digging in Excavating for Lock No. 8. The Size of the Shovel and Height of the Bank May Be Estimated by Comparing with the Fireman Standing on the Running Board of Shovel.

dollars. Behind this lies the harbor with a channel 500 feet wide running from the canal to deep water, dredged to a depth of 30 feet.

C. S. Boone in his submarine excavation was

Rock Excavation on Section No. 8.

up against 750,000 cubic yards of submarine rock and 200,000 cubic yards of submarine earth. All of which he is handling with two dipper dredges. Several drill boats are in use, and some idea of the difficulty of this rock work may be gained from the powder records which show that one and one-half pounds of dynamite were required for every yard of rock moved.

The Northern Construction Company, Limited, and Stewart & Welch handled the dry land excavation, starting their work June 3, 1924. This section of the ditch is 200 feet wide on the bottom and 40 feet deep.

(Continued on page 145.)

Vertical Lift Bridge at Wabash Crossing. Old Bridge Over Old Canal Is Just Beyond the New Bridge.

The EXCAVATING ENGINEER

A Monthly Publication Devoted to Excavating and Allied Subjects

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The Business Situation

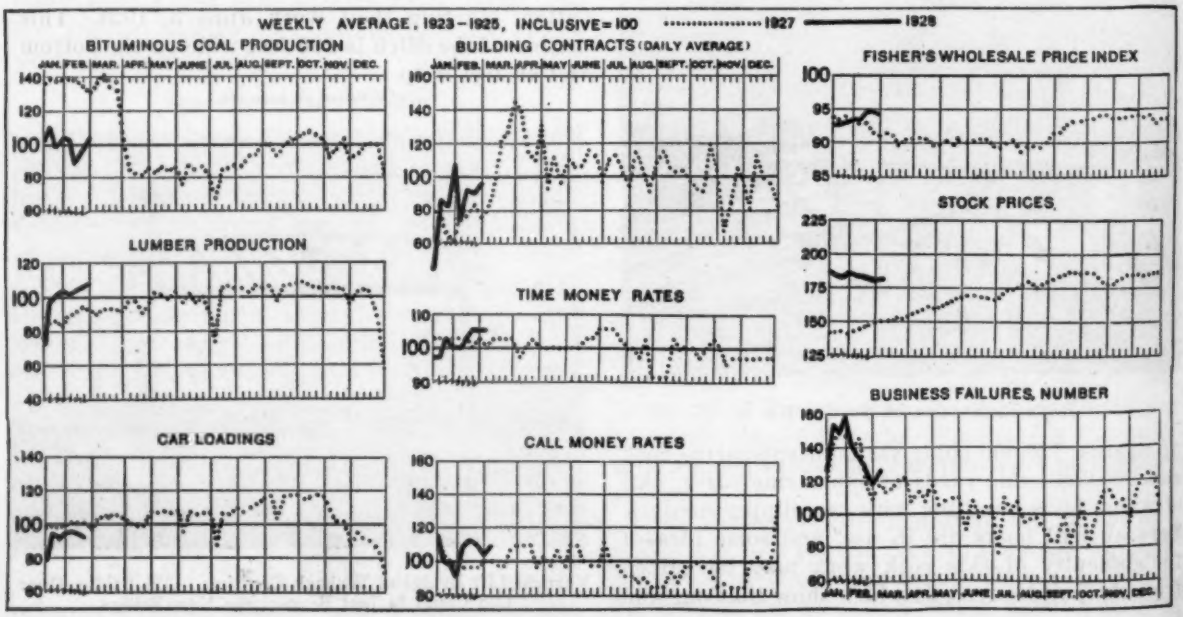
Measured by the volume of checks passed for payment through the banks of the United States, business during the early weeks of January was running in advance of both the previous month and the corresponding month of 1927. This figure should not be judged alone, however, as it reflects the amount of speculation on the stock market as well as the activity of business. An indication of this is seen in the fact that the volume of goods moving through primary channels shown by figures on car loadings was smaller than last year. The principal decline occurred in loading of minerals and agricultural products.

The psychological aspect of business conditions should never be lost sight of. Today the feeling of business men with regard to the future is a good deal more reassuring than it has been for some months. There has been some tendency to center attention on the old bug-a-boo of the bad election year, but a careful analysis of the situation leaves one still looking for a serious, concrete, unfavorable factor. Says the National City Company in their business bulletin for March; "Aside, however, from such psychological influences, there seems no reason why business should not look forward to a year of gradual improvement. By and large there are no burdensome inventories to be worked off. On the contrary, inventories generally have been allowed to run down to the point where some stocking up would now seem to be in order. Money conditions continue easy and there is an abundance of funds seeking investment. Such conditions are favorable to enterprise and pave the way for projects whose carrying forward involves employment of labor and consumption of materials — in other words, provides the ground work for general business recovery."

Building and engineering contracts awarded during the month of February in the 37 states east of the Rocky Mountains amounted to $465,331,300, according to F. W. Dodge Corporation. The above figure was the highest February contract total ever recorded for the 37 states. It was 9 per cent ahead of the January 1928 total and was 18 per cent over the record for February of last year. The territory covered by this record included approximately 91 per cent of the total construction volume of the country.

Four districts made new high totals for the month of February, the new records being reached by New York State and Northern New Jersey, Middle Atlantic States, the Central West and Texas. The New England states had a total which was next to the largest February on record.

Last month's contract total for the 37 states included the following items of note: $238,985,100, or 51 per cent of all construction, for residential


WEEKLY AVERAGE, 1923-1925, INCLUSIVE=100 ····· 1927 ——— 1928
BITUMINOUS COAL PRODUCTION
BUILDING CONTRACTS (DAILY AVERAGE)
FISHER'S WHOLESALE PRICE INDEX
STOCK PRICES
LUMBER PRODUCTION
TIME MONEY RATES
BUSINESS FAILURES, NUMBER
CAR LOADINGS
CALL MONEY RATES
JAN. FEB. MAR. APR. MAY JUNE JUL. AUG. SEPT. OCT. NOV. DEC.

buildings; $59,980,200, or 13 per cent, for public works and utilities; $57,695,400, or 12 per cent, for commercial buildings; $35,413,700, or 8 per cent, for social and recreational projects; and $34,881,300, or 7 per cent, for industrial buildings.

The February contract total brought the amount of work started since the first of this year up to $892,500,000, this being a gain of 15 per cent over the amount started in the first two months of last year.

New work contemplated during the past month in these states amounted to $947,003,400. This figure shows an increase of 5 per cent over the amount reported in the preceding month, and was 50 per cent ahead of the amount reported in February, 1927.

The cost of living in the United States, according to the United States Department of Labor statistics, has dropped during 1927 to 155.4, on a scale whereby the living cost in 1913 would be 100, in 1926 was 160.6, and for 1920, 203.4.

Savings in savings-banks today amount to some $26,091,000,000 or $220 per capita. If it is fair to say that this figure represents primarily the deposits of small investors, it indicates that the working man is pretty well off today.

As the productivity of labor is a direct factor in the rate of wages paid to labor, it is interesting to note the following table showing the percentage increase in labor productivity in ten important industries over the period from 1914 to 1925 — the figures are from the United States Department of Labor:

Rubber tires	211%
Automobiles	172%
Petroleum	83%
Cement	61%
Iron and steel	59%
Flour milling	40%
Paper and pulp	34%
Sugar refining	28%
Meat packing	27%
Leather tanning	26%

This increased productivity comes from machinery and power placed in the hands of labor to accomplish the results formerly accomplished by hand work. The fewer workers made necessary by this increased productivity is more than offset by the constant absorption by other industries (than manufacturing) and by agriculture, garages, gasoline stations, restaurants, and so forth, of the men released from toil by machinery. The whole process results in a higher standard of living for all concerned.

Steel production during the month of January exceed by 26 per cent the production of last December and by five per cent that of January a year ago. In February the mills were operating at eighty-five per cent capacity compared with 60 per cent in December, the low point. Buying is not unusually active at the present time, but the lull which follows an active contract period is regarded as normal. The outlook for consumption in building, automobiles, farm implements and miscellaneous lines is good.

During February nine of the Federal Reserve Banks established rediscount rates at four per cent, leaving only Cleveland continuing at the old rate of three and one-half.

With the central bank rates at higher levels, open market rates have naturally tended to be firmer. As indicated, however, by the following table, the advances have been moderate in character; bankers' acceptances are somewhat lower, and commercial paper is no higher, than a year ago:

	Last Week of Feb. 1928	January Low Point	Last Week of Feb. 1927
Call loans	4¼-4½	3½-4	4 -4½
Time loans, 60-90 days	4½-4⅝	4⅛-4¼	4⅜-4½
Time loans, 4-6 months	4½-4⅝	4⅛-4¼	4⅜-4½
Bills, 90-day (offered)	3½	3¼	3⅝-3¾
Commercial paper, best	4	3¾-4	4
Commercial paper, other	4¼	4¼	4¼

Moving 63,000,000 Cubic Yards for Welland Ship Canal

(Continued from Page 143)

Two Million Pounds of Powder Without An Accident

A remarkable feature of their work was that in moving two million yards of rock and one million yards of earth they used two million pounds of powder without a single accident — a record to be proud of. Their equipment consisted of a Bucyrus 320-B shovel, two Bucyrus Class-24 draglines, a Bucyrus 70-C, an Osgood Class 70 railroad shovel, and a Marion Model 37 railroad shovel. They used ten 50-ton locomotives, hauling Western dump cars, on a haul averaging from three to four miles.

On this Northern Construction job, Harstone & Williams did some very nice drilling work. The holes were put down along the desired face and were drilled only 12 inches apart. These holes were not loaded but the nearest charged holes were placed 20 feet away from this line of close drilling. By using this method, the shooting left a vertical wall better than could be obtained in any other way. On this job the rock broke into rather large pieces and considerable secondary blasting was necessary. Dewatering required the pumping of 12,000 gallons per minute.

Seven Come Eleven

Seven and eleven have both rolled by and the Western Road and Equipment Exposition held at Los Angeles, California, March 7th to 11th, has passed into history. The big tents, frame structures, and demonstration field space covered more than thirty acres. It was a big show, well put on, and the men who put it over are to be congratulated.

Photo by Underwood & Underwood.

And here is just one of the attractions — one of the Bucyrus-Erie machines (a Gas + Air) exhibited at the Exposition that has just dug up a dipperful of California loveliness. It looks as though at least one of the young ladies was anxious to get back down to earth again.

Gaillard Memorial Tablet Placed on Face of Contractors' Hill

A bronze tablet dedicated to the memory of Lieutenant-Colonel David Du Bose Gaillard, Division Engineer of the Panama Canal, under whose charge the excavation of Culebra Cut was carried on from July 1, 1908, until July, 1913, was unveiled on February 4, 1928, at a prominent place on the rock face of Contractors' Hill, 103.5 feet above the normal surface of the Canal at that point. The tablet was provided by Mrs. David Du Bose Gaillard and family and the Third United States Volunteer Engineers' Memorial Association, composed of members of the regiment commanded by Lieutenant-Colonel Gaillard during the Spanish War. The work in connection with the erection of the tablet was done by the Dredging Division. The Culebra Cut was renamed "Gaillard Cut" by Executive Order, in 1915.

Revision of Federal Aid Road Law Urged

The American Road Builders Association is actively campaigning for 100% Federal Aid Roads through sections in which the States receive little or no taxes.

At present it is practically impossible to travel by motor car from Idaho or Montana to the Southwest states without crossing and re-crossing the Sierra Nevada or Rocky Mountains. Charles M. Babcock, president of the Association, declares, "This waste of valuable time and mileage is due to unclosed gaps in the nation's primary highway system. The closing of these gaps is fundamentally an obligation of the Federal Government.

"In order that highway communication may be established through the sparsely settled regions of the West, it is essential that the Federal Aid Road Law be immediately revised to facilitate the closing of gaps in the primary highway system. The law should permit the Bureau of Public Roads to construct these roads entirely at government expense, instead of permitting the grant of only a portion of the cost under the present law."

Mr. Babcock cites especially the need of through connections in Arizona, north of the Grand Canyon.

"Highway communication between Utah and Arizona is made virtually impossible because of stretches of unbuilt roads mostly through government land in this section, which is completely cut off by the Grand Canyon from the settled area of Arizona, and consequently has no roads. It is the duty of the Federal Government to close such gaps immediately.

"Another example of the scenic regions which may be opened by the construction of Federal Aid Roads may be found in the famous Rainbow Natural Bridge section of Utah. Few white people have been able to penetrate this beautiful region because of inadequate highway communication. This communication may be established by the national government without excessive cost, thus making accessible to tourists one of the most beautiful scenic regions in the world.

"It is not generally known that tourist travel from the East to the real scenic Southwest is almost impossible. It may be made possible, however, by a moderate increased expenditure of Federal funds in sections which are essentially Federal lands."

This campaign seems timely and well founded. It will be unfortunate, indeed, if the country at large must wait to enjoy the most beautiful of the nation's scenic treasures until the sparsely populated districts in which they lie may become sufficiently settled to permit state highways largely at state expense.

"Four-Yard" Dipper Was a Three-Yard Dipper

In our March issue an announcement of the winners of the Bucyrus-Erie contests at the Natonal Crushed Stone Convention and the National Construction Exposition, referred to the Low Cost Dipperful presented at West Baden as a four-yard dipper. This was in error as the dipper was of three-cubic-yard capacity, struck measure, the standard size used on the Bucyrus-Erie 100-B quarry shovel.

DEVICES YOU OUGHT TO KNOW ABOUT

Extreme Simplicity in Caterpillar-Type Mounting

One of the most important new developments in excavating machinery for road-building and general contracting noted in recent convention exhibits was the "Single Shaft Drive" caterpillar-type mounting for shovels and cranes introduced by the Bucyrus-Erie Company.

Since caterpillar-type mounting has come to be recognized generally as the most satisfactory for power shovels and cranes, the most important consideration now is to get the continuous-tread mounting in its simplest and most reliable form.

As the new mounting has fewer parts, extra strength can be built in with no added weight. Besides which, this new mounting combines several unique features that users are finding very valuable in service.

The "Single Shaft Drive" mounting is in the highest degree non-clogging — even when it is shoveled full of dirt, it throws out the material as it moves ahead its own length. The drive chains, which are of hardened forged steel, are self-cleaning.

It easily takes grades of 30 per cent, and steeper. A two-way brake, which operates with a ratchet effect, allows free movement in either direction as desired, but locks the machine against the digging, or on a grade.

Sharp turns can be made with this mounting, as well as gradual turns. It can make either a right-angle turn in one spot, or a long radius turn — steering from either end of the treads, with the machine moving either forward or backward.

Another feature of this mounting is its perfect accessibility for renewing or inspecting parts. Any wearing part of this mounting can be quickly and easily removed without disturbing any other part.

With only one drive shaft and gear below the deck, the extreme simplicity is very noticeable. The one gear and its pinion are enclosed, protected against dirt and grit — and operate high above the ground. There is a 12-inch clearance underneath; nothing to drag when moving over rough uneven ground.

The truck frame is a one-piece annealed steel casting, 23 inches deep — practically indestructible. Drive shaft splined — no keys. Treads are exceptionally strong, and have hardened steel pins.

All Gas + Air and B-2 Steam Bucyrus-Erie machines are now being furnished with this new mounting as standard euipment.

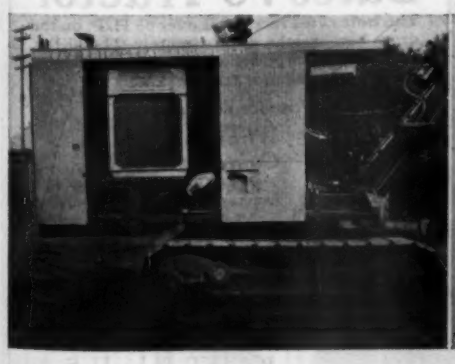
Lakewood Puts Out Improved Graderooter

The Lakewood Graderooter for 1928, manufactured by the *Lakewood Engineering Company, Cleveland, Ohio,* is equipped with double-pointed teeth made of high-grade steel, one-inch thick, instead of single-pointed teeth three-quarter-inch thick, as previously used.

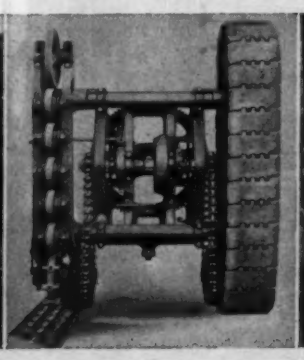
The teeth can be set to root twelve inches deep and forty-eight inches wide. Ten teeth are furnished with each machine.

The Graderooter is used wherever a rooter plow can be employed. A particular advantage is that it will work close to the forms. It is light enough to be pulled by teams and strong enough to stall the heaviest tractor.

The Graderooter is also used for maintenance work by the State and County Highway Departments.



This mounting sheds dirt. Even when shoveled full of coarse cinders, it cleans itself out in moving its own length.



Only one drive shaft below the deck — only one set of gears. Has every good operating feature, combined with unrivalled simplicity.

The "last word" in rugged strength and simplicity. One-piece truck frame casting is 23 inches deep.

SHOTS FROM THE FIRING LINE

Eastern States Notes

A merger of the Pennsylvania-Dixie Cement Corporation and the North American Cement Corporation is reported near completion. The pending consolidation is believed in cement circles, it is said, to be the forerunner of a larger unit embracing International Cement Corporation. This would give the consolidation plants in Argentina, Uruguay and Cuba, thereby creating a concern that would have output of favorable comparison with such companies as Lehigh, Universal, Atlas and Alpha. Pennsylvania-Dixie Cement owns seven plants, in Pennsylvania, New York, Tennessee and Georgia, with an aggregate annual production of 10,000,000 barrels of cement. North American Cement, Albany, New York, owns plants at Hagerstown, Maryland, Berkeley, West Virginia, and Catskill, New York. Annual production exceeds 4,000,000 barrels.

Mr. Moses Burpee, who for many years past has been the chief engineer of the Bangor and Aroostook Railroad Company, with headquarters at Bangor, Maine, has at his own request retired from that position and has been appointed consulting engineer. Mr. P. C. Newbegin, has been appointed chief engineer, vice Mr. Burpee.

Canada

Montreal and Vicinity

BY J. M. WARD

Messrs. P. Lyall & Sons Construction Company are preparing for their new Back River Power Development near Montreal. It is thought that a considerable portion of this work will be sublet.

Alcoa Power Company, which is a subsidiary of The Aluminum Company of Canada, are doing considerable work on their new power development at Shipshaw.

Dibble Construction Company of Ottawa and C. V. Billie of Montreal have been awarded highway contracts for the Interprovincial Highways.

The National Cement Company of Montreal has been sold to Mr. Alfred Rogers of Toronto, who is connected with the St. Mary's Cement Company.

Anthracite Region Notes

BY T. H. BARRETT

A. E. Dick of Hazleton is digging the approach to the big three-mile tunnel of the Lehigh and Wilkes-Barre Coal Co. at the west end of the job and hopes to have the approach ready for further tunnel driving by June.

Suender & Hill of Frackville have been awarded the east half of the tunnel.

Rhoades Contracting Co. of Ashland have been awarded a reservoir job between Ashland and Minersville by the Minersville Water Co.

The Rousing Coal Company, now operating in the Fairchild's tract of land in Pond Creek, are planning to do some extensive mining at the pit concession this summer.

Bates Tractors

BATES 70

3 Sizes

BATES 28 — Made for 8-foot Graders and equipment of similar capacity.

BATES 40 — Made for 7-yard Caterpillar Wagons, 10-foot Graders, etc.

BATES 70 — Made for 12-foot Graders and any of the largest tractor tools.

[LET US TELL YOU WHAT OUR CUSTOMERS SAY]

Bates 70 Tractor

The Bates 70 Tractor has over 65 H. P. on the draw bar, weighs approximately 22,000 lbs. and has reserve power when pulling the largest equipment made for tractor power.

Write for new catalog.

What Some Bates Customers Say:

"The long crawlers are a great advantage", says Illinois Contractor.

"After sixteen months' service our next tractor will be another Bates", says Indiana Contractor.

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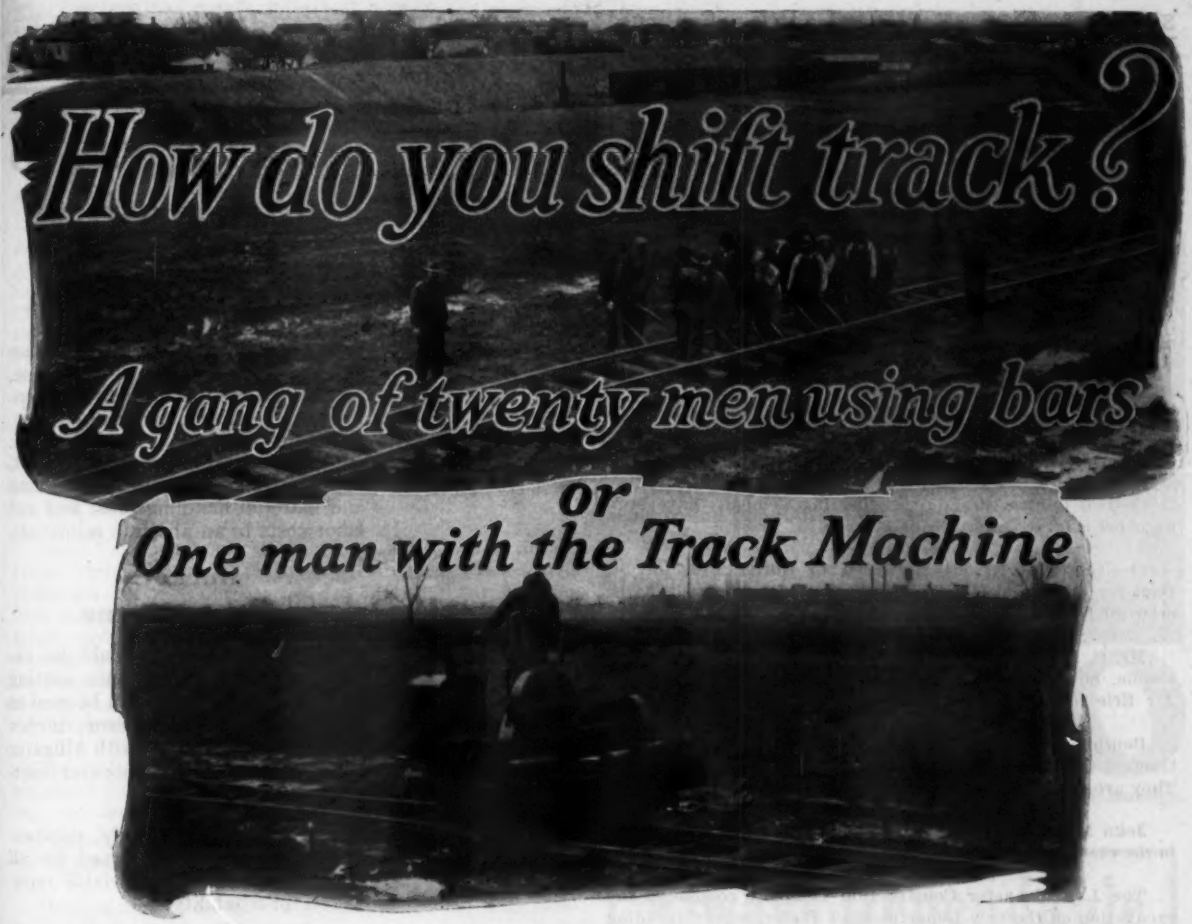

The Track Machine
is being used by
Railroads
Contractors
Open Pit Mines
Quarries
and other places where track is being shifted, raised, ballasted or steel re-laid.

No one would use a horse and buggy for quick transportation in this automobile age. It is too slow! Where time means money, it is too expensive! The same principle applies to the use of hand labor that can readily be replaced with machinery, yet there are many who have track to raise or shift who still persist in the old-time hand methods of using a large track gang with bars and jacks, when the Track Machine and one man can take their place.

On the above railroad construction job, a Nordberg Track Machine was used in building a long fill, also for moving the loading track at the shovel. It replaced this gang of twenty men previously required to shift track by hand. It shifted track that was embedded in soft, heavy clay, where it would have been almost impossible to work with bars.

If you have track to raise, shift or ballast, write our Track Machine Department for Bulletin GR-8, and for further particulars regarding this great labor-saving machine.

NORDBERG MFG. CO., Milwaukee, Wis., U.S.A.

THE NORDBERG PATENTED TRACK MACHINE

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SHOTS FROM THE FIRING LINE — Continued

Detroit and Vicinity

BY F. M. RICHARDS

Dunbar & Sullivan are preparing to bring in their Bucyrus Class-24 dragline recently purchased from the McWilliams Company in Louisiana.

The Koenig Coal & Supply Company are making rapid progress on their new gravel pit at Oxford, Michigan.

Mr. O. E. Gooding, superintendent of the Oxford plant of the Standard Gravel Company, reports that they have completed their drainage ditch with their Bucyrus 30-B electric machine.

J. S. Kuhn, is now located in Mt. Clemens, Michigan.

Joseph Rossi was recently awarded contract for sewer work in Dearborn, and is digging this job with his Bucyrus 50-B and is backfilling with his Bucyrus 41-B.

Central Contracting and Engineering Company have been awarded a large sewer job in Pontiac.

Contract was recently awarded to Butler Bros. of St. Paul for construction of vehicle tunnel under Detroit River between Detroit and Windsor, Ontario.

Mr. C. R. Berner of Detroit is leaving for El Centro, Colombia, South America, where he will operate a new Gas + Air Erie for the International Petroleum Co.

Beuthien-Persinger have been awarded a stripping contract at the Huron Gravel Company pit at Dexter, Michigan. They are using their Erie Gas + Air shovel on this job.

John M. Nardi has completed the excavation for the city in the reconstruction of the buildings in Central Park, Detroit.

The J. A. Schaefer Construction Company completed the excavation on the new Department of Water Supply Building in the downtown district, Detroit.

J. E. Snyder & Sons of Ann Arbor, Michigan, and their Erie B-2 shovel are working for the University of Michigan.

Cecil Bailey is operating a 21 Marion for the Ebersbach Construction Company in Ohio while Richard Billings is playing "Five Foot Two" on the banjo between fires.

Southern States Notes

BY W. W. WHORLEY

William Foster is operating a Bucyrus 50-B dragline for the Memphis Stone & Gravel Company, at McCullough, Alabama. Mr. R. L. Swafford is superintendent in charge.

P. F. Burke, who has been on a shovel for the Hardaway Contracting Company, in North Carolina, was a recent caller at this office.

Gus Anderson, formerly with the United States Reclamation Service, in the West, has been handling a Bucyrus Class-9½ dragline for C. G. Kershaw at Columbus, Mississippi.

W. O. Leonard writes that he is doing some fine work for Winston & Company, with a Bucyrus 70-C shovel on their railroad job at Edgefield, South Carolina.

Harry Jones is doing basement excavation work with a Massilon shovel for C. H. Boyd, at Birmingham, Alabama.

Mr. T. A. Robinson, of Robinson Brothers, Hosston, Louisiana, paid us a visit recently, while passing through Birmingham. Mr. Robinson reports that he is well pleased with the performance and fuel economy of his Bucyrus 50-B Diesel dragline.

Mass Production

—opens a way to bigger profits for you!

Makes this price possible.

$4,750

F.O.B. Findlay, without bucket or cab. Prices of buckets or cabs upon application.

BY concentrating our production on a single standard size crane, Model O, we are able to offer you exceptional value at an extremely low price.

You can now, at small initial cost, add greater efficiency to your loading and material handling jobs, and cut labor costs to an absolute minimum.

Buckeye Model O Crane

does everything that would be expected from many cranes costing double the money. It can be used as a backfiller, clamshell, crane, ditcher or dragline. Equipped with Alligator traction and fast revolving and hoisting speeds.

Built in the same sturdy, substantial manner that has earned for all Buckeye products an enviable reputation for reliability.

Write for the new Model O Bulletin explaining in detail all the features of this remarkable little crane.

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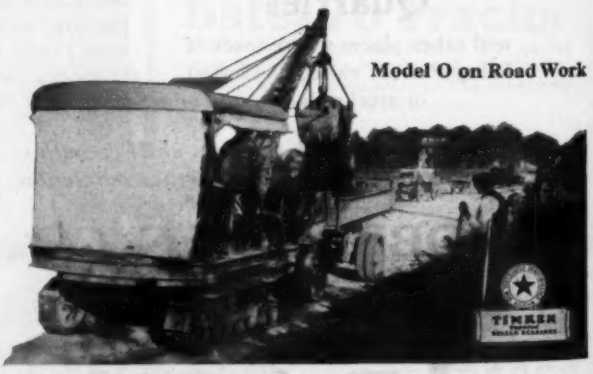

Model O on Road Work

for over thirty years **Buckeye**

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SHOTS FROM THE FIRING LINE — Continued

Jack Freeze, Jim Cooner, and George Beasley, who are with the Kershaw Mining Company, at Carbon Hill, Alabama, visited us recently. They report a muddy winter for the Bucyrus 175-B stripping crew.

St. Louis Items

BY A. J. KOENIG

J. A. Kreis & Sons have started on their new Missouri Pacific work west of here. They are going to do the grading and the Gray Summit tunnel, 1600 feet in length. This section has approximately 1,000,000 yards of rock and common. Clippen Construction Co. subbed the 550-foot tunnel and about 300,000 yards of open excavation at Labadie, Missouri. The following subcontractors will do the concrete work: Campbell & McGregor, Ozark Engineering Co., Hedges & Weeks and Kreis & Jones.

Winston Bros. have made rapid progress on the Missouri Pacific Railroad double-tracking work between Labadie and Gasconade, Missouri. They have five steam shovels on the job and expect to finish in about four months.

Since Colonel Lindbergh's return from the south, the St. Louis Flying Field has been a lively place. The Curtis Robertson Aircraft Corporation and Mahoney Airplane Co. have started work on manufacturing plants there. The first thing needed was a railroad switch to connect with the Wabash Railway, which the Industrial Track Construction Co. constructed under adverse conditions in rapid time. This construction company is also building a macadam roadway extending along the entire factory site.

The United States Cold Storage Co. at Kansas City contemplates the building of a produce terminal, including buildings and team tracks.

Cameron, Joyce, Smith, Elder Co. were awarded contract for highway work in Adams County, Illinois.

Higgins, Dyer & Co. have a grading job on the state highway in Hamilton County, Illinois.

Tom Higgins finished his work on the Burlington Railroad near Fairberry, Nebraska, and is moving his outfit on to a new Union Pacific job in Wyoming.

Cook & O'Brien have started on their Santa Fe Railroad work near Augusta, Kansas.

Massman Construction Co. were awarded two new river jobs by the government.

Ed. Meigan has his outfit at work on State Highway No. 71 at Kansas City, Missouri.

The W. C. Hill Construction Co. have opened a new quarry near Ottawa, Kansas.

Ed. McGuire landed a nice state highway job in Illinois.

R. T. Amis has a shovel and fresno outfit at work in Logan County, Arkansas. He also has a shovel outfit at work on the Santa Fe Railroad in Kansas.

Nelson Construction Co. were awarded contract for state highway work in Bond County, Illinois.

Oklahoma, Kansas and Missouri Notes

BY F. W. KNABLE

E. E. Matsen, contractor, Chandler, Oklahoma, is progressing very nicely with his drainage work located near Davenport, Oklahoma.

The Zenith Limestone Company, Tulsa, Oklahoma, are making several changes in their quarry operations.

Here's what we mean by

vibrationless

This 2-cylinder Novo Rollr Engine is running at 1800 r. p. m. The pencil standing on top remains *motionless*. That's what we mean by *"Vibrationless."* Send today for complete details.

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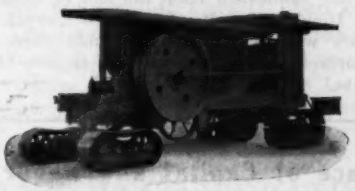
Always Dependable

"CLIPPER" Blast Hole Drills are built for real service. Their construction provides simplicity with ruggedness, speed drilling with constant production, and economical operation with all weather service.



"CLIPPERS" will drill the maximum number of feet per day—*per month* and PER YEAR in your own rock strata whether it be soft or hard.

Let us tell you how "CLIPPER" Blast Hole Drills will cut your drilling costs.

THE LOOMIS MACHINE CO.
(Established 1842) K Street, Tiffin, Ohio

SHOTS FROM THE FIRING LINE — Continued

The local drainage and flood control committee of the Chamber of Commerce, Wichita, Kansas, will present to the city commissioners the plan to build a branch canal to drain that part of the city lying north of 21st Street. It is represented that a free right-of-way for the proposed ditch is available.

A. A. Davis Company, Kansas City, Missouri, is progressing nicely with their work located at St. Joe, Missouri.

Pacific Coast Notes

BY J. H. SACKETT

Contract has been officially awarded by the City of Santa Barbara and other interested parties to Merritt, Chapman & Scott, Box 207, San Pedro, for completing rubble mound-type breakwater. About 120,000 tons of stone remains to be placed. Original contract involving 180,000 tons of rock was awarded in March, 1927, to A. J. Grier, Oakland, at $2.38 a ton, total bid of $380,800.

Bonds have been voted by the Woodbridge Irrigation District, Woodbridge, San Joaquin County, in amount of $325,000, of which $250,000 will be used to purchase system of the Stockton Mokelumne Canal Company, and the balance of $75,000 for the construction of canals, etc. A. L. Cowell is secretary of the Woodbridge Irrigation District, Woodbridge, San Joaquin County, and Chas. Widdows, 327 East Channel Street, Stockton, is engineer for the District.

The City and County of San Francisco is considering holding a bond election on about May 1st to vote on issuing bonds as follows: $24,000,000 for the completion of the Hetch Hetchy project; $40,000 for the purchase of the present water system of the Spring Valley Water Co.; M. M. O'Shaughnessy, City Hall, San Francisco, is the city engineer of San Francisco.

The City of San Diego is considering holding bond election to vote on issuing bonds in amount of $1,500,000 for the completion of the Sutherland Dam project as follows: $500,000 for completing construction of the Sutherland Dam; $750,000 for construction of conduit from Sutherland to San Vicente dam-site; $150,000 for diversion dam at San Vicente; $100,000 for pipe line from San Vicente to connect with the El Capitan pipe line at Lakeside. J. W. Williams is city hydraulic engineer, City Hall, San Diego.

Plans and specifications are being prepared by California Department of Public Works, Division of Highways, Highway Building, Sacramento, and bids will be called for shortly for 13 miles of the Skyline Boulevard from the end of existing improvement at La Honda Summit, San Mateo County, to Saratoga Gap. Work will involve 800,000 cubic yards of grading, also rock surfacing, etc. This job will require from 8 to 10 power shovels.

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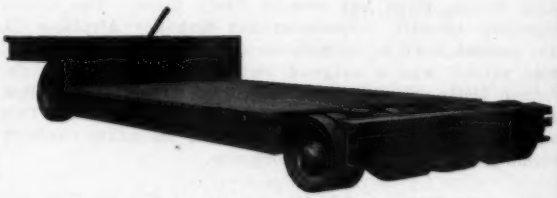
For Hauling Steam Shovels and Other Heavy Equipment



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This Trailer has a carrying capacity of 30 tons and can be loaded over the rear end as well as from either side. It is equipped with rubber tires, Timken bearings, and internal expansion brakes.

There are two wheels in front and four in the rear. It can be turned in its own length and a 5-ton truck will haul it with a 30-ton load.

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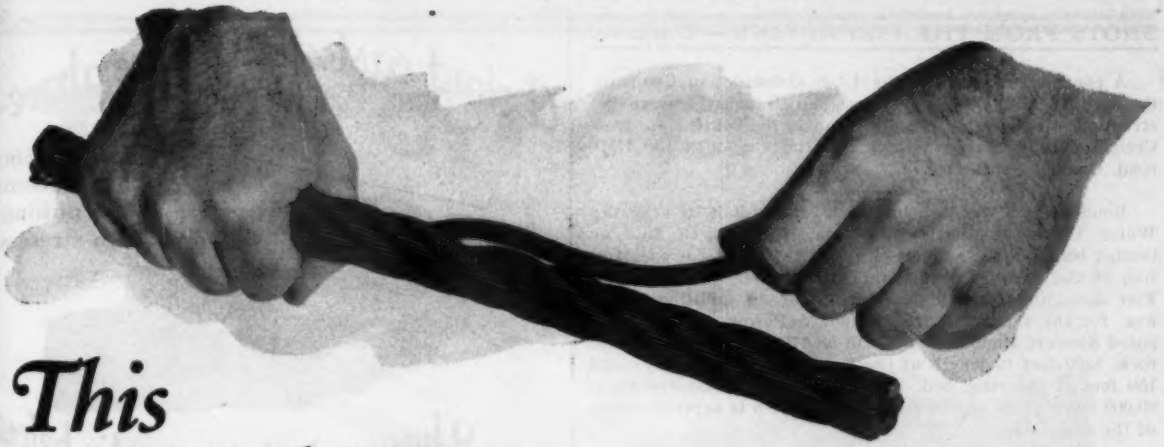

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Cut Our Cable Costs in Two

THE first time I saw a piece of Tru-Lay Brand cable was in a nationally known testing laboratory.

The Director had a sample (left from some tests). Neither end was seized; that immediately commanded my attention. "That'll fly to pieces," I exclaimed. He laughed—unwrapped a strand—then a wire from the strand—reversed 'em—put 'em back —*good as ever.*

That convinced me. We had a hard-headed Superintendent but when I got a sample of my own I only had to stage one demonstration—he kept the sample.

To make a long story short, we put in some test cable—found it practically doubled the life, just as you might expect (for this cable eliminates torsional strain and puts an even load on all wires). Now Tru-Lay Brand is standard with us.

My advice is the thing I did—get a sample and stage your own demonstration.

A typical example of increased service and economy of Tru-Lay was reported by a contractor. He was working a shovel through clay and rock, using the shovel as a hoe. "Cat" locks were required. As he puts it: "When the hoe hit solid rock or stump, the engine stalled or the cable broke—and the engine didn't stall! Then we put on Tru-Lay. It completed the job of 15,000 lineal feet of trenching and excavated 3 cellars. You said 'try it and let us know how you like it' and this is *how*."

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SHOTS FROM THE FIRING LINE — Continued

A contract awarded to the Utah Construction Company, Ogden, Utah, and Phelan Building, San Francisco, covers construction of 53 miles of new branch line extension from Creighton to Egbert, Wyoming, for the Union Pacific Railroad, Omaha, Nebraska.

Bond election will be held March 20th by Salt River Valley Water Users' Association, Phoenix, Arizona, to vote on issuing bonds in the amount of about $4,100,000, for construction of the Stewart dam about 10 miles below the Mormon Flat dam, and for the development of an additional 7000 kva. for the Central Arizona Light & Power Co. The proposed Stewart Mountain dam will be 170 feet high above bedrock, 1200 feet in length at the top, including spillways, and 150 feet at the river bed. The structure will involve about 80,000 cubic yards of concrete. C. C. Cragin is superintendent of the association.

A contract has been awarded to the Utah Construction Co., Phelan Building, San Francisco, by the Southern Pacific Railroad Company for the construction of 19 miles of railroad from Perido to Calva, near Coolidge Dam, Arizona, on the Globe branch line.

The California Portland Cement Company has a well-defined plan to replace its kilns with larger and more modern types at the Colton, California, plant. There will be considerable changes made in the storage facilities.

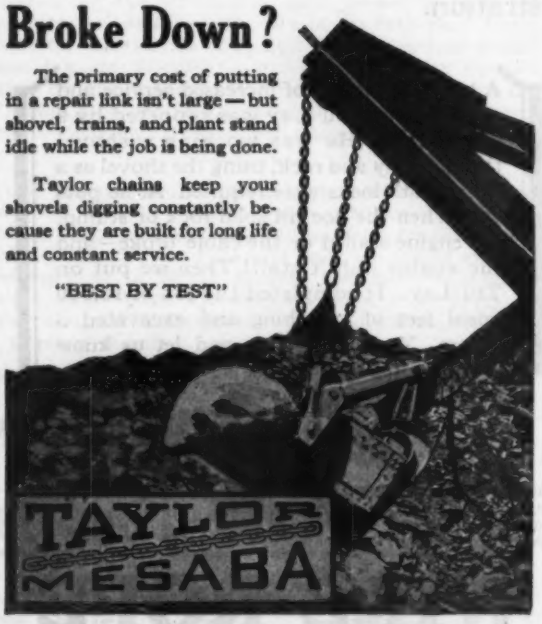
Plans are being prepared by Consulting Engineer A. Kempkey, Hobart Building, San Francisco, for the construction of the following improvements for the Utility & Service Co., Inc., 108 Sutter Street, San Francisco: Dam — Construction of the Conn Valley Dam in Napa County, to be probably earth-fill-type, 128 feet high and 700 feet long; Pipe Line — Construction of 35 miles of 30-inch to 40-inch pipe line, type

Broke Down?

The primary cost of putting in a repair link isn't large — but shovel, trains, and plant stand idle while the job is being done.

Taylor chains keep your shovels digging constantly because they are built for long life and constant service.

"BEST BY TEST"



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A rigid cast-steel bridge above

double rigidity to overcome all pulling-in stresses.

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USE THE WILLIAMS "DOUBLE-ARCH" DRAGLINE — the bucket that has the strength and stamina to stand years of hard digging without drawing in at the sides.

Correct distribution of weight to give greatest digging power for each job — your WILLIAMS "Double-Arch" Dragline cuts at the right angle and bites right in, the instant the drag cable is taut.

And in the complete WILLIAMS line of Clamshell Buckets, there's one especially designed to do your excavating or rehandling — "Built to Dig, and Last While Digging."

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TWIN CITY ENGINES

THIS is the Sargent Junior—new type ⅝-yard dragline, 36′ boom—equipped with Model FE Twin City 4½ x 6, 4-cylinder Engine. Twin City Engines will make good on ***your*** equipment, just as they are making good on Sargent equipment.

Write for full information.

MINNEAPOLIS STEEL AND MACHINERY COMPANY

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The Ever-increasing Chain of TWIN CITY ENGINE Users includes the following:

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SHOTS FROM THE FIRING LINE — Continued

of pipe not decided, from Napa Valley to the Carquinez Strait. Plans and specifications for the work will be completed in about two months.

The City of Salt Lake City, Utah, is considering holding bond election soon to vote on issuing bonds in amount of $3,500,000 for the construction of the Big Cottonwood Canyon Reservoir at the Argenta site. H. C. Jessen is city engineer of Salt Lake City.

Contract was awarded by the Western Pacific Company, Mills Building, San Francisco, to W. A. Bechtel Co., 206 Sansome Street, San Francisco, with whom is associated the Kaiser Paving Company, Latham Square Building, Oakland, for furnishing rock for ballasting 300 miles of railroad from Portola, Plumas County, to Oakland, California. Quarry to be constructed by Bechtel & Kaiser in Butte County is to have capacity of 4000 tons per day. Three miles of 85-pound rail and ties has been purchased. Conveying equipment to be furnished by Bodinson Mfg. Co., San Francisco. Western Pacific Railway Company will haul and place the rock.

Thompson Brothers of Fresno have been awarded several contracts in Fresno and Bakersfield.

NOTICE!

Index for The Excavating Engineer
Vol. XXI — 1927

May be obtained on application to

THE EXCAVATING ENGINEER
SOUTH MILWAUKEE, WISCONSIN

Fast Work has made Fast Friends

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Hayward Engineers are fitted to recommend a bucket to fit the job in every case. The scope of the Hayward line affords a wide range of choice.

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Dependable dump cars were necessary on this heavy Denver, Rio Grande & Western work—Yes, they were ***Westerns.***

Westerns Stay on the Job!

There is as much difference in dump cars as in men. You insist on men who will ***stay on the job.*** Why not dump cars also?

BETTER BUY WESTERNS NOW THAN BUY AND BUY

The Western 4-yard and 5-yard cars for narrow gauge operation ***stay on the job.*** This means that they will ride a rough track; they will keep out of the repair shop; they are strong enough to stand up even under abuse; their few and very accessible castings can be replaced ***quickly*** when necessary.

Your shovel earns you nothing while waiting for cars. Let us help make this year a big one for you. We can give quick delivery.

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TRADE NOTES

Dr. George E. Ladd, Economic Geologist, U. S. Bureau of Public Roads, has been appointed consulting geologist by the *Armco Culvert Manufacturers Association.* Dr. Ladd's professional career began at the leading universities of America and Europe and has included positions of the highest distinction, among them being presidencies of the Missouri School of Mines and Metallurgy, the New Mexico College of Agriculture and Mechanical Arts, and the Oklahoma School of Mines and Metallurgy. Long ago recognized as the foremost engineering geologist, he has within recent years made a special study of landslides and how to control them. By the present appointment the services of Dr. Ladd become available to all public and private officials who are confronted with difficult and unusual landslide, subsidence, drainage and similar problems. His headquarters will be at Middletown, Ohio.

The Geo. D. Whitcomb Company of Rockelle, Illinois, announces the appointment of Mr. Ralph Rollins as its sales representative in North Carolina, South Carolina, and southern Virginia.

Mr. Rollins was formerly with the Easton Car Construction Company of Easton, Pennsylvania. He takes up his new duties at once, and has established headquarters at 1206 Commercial Building, Charlotte, North Carolina.

Schramm, Inc., has opened new branch offices at 220 East Brady Street, Tulsa, Oklahoma, 75 Fremont Street, San Francisco, California, and 192 Boylston Street, Boston, Massachusetts, in order to facilitate the handling of the Schramm compressors.

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If they are as good as we say, you will be amazed —try them—we guarantee satisfactory service.

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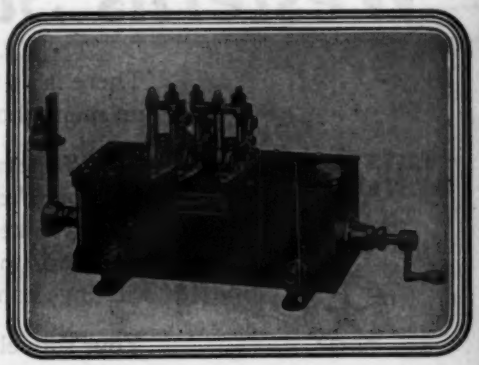
A McCord Force Feed Lubricator Will Keep Your Shovel on the Job

A McCord force feed lubricator installed on your steam shovel now will insure more continuous operation. Dependable force feed lubrication prevents shutdowns and delays, it gives more hours on the job.

McCord force feed lubricators are used as standard equipment by the largest and best-known steam shovel builders and they will be installed on any shovel at your request.

Put a McCord lubricator on now and be assured of dependable lubrication for the life of your shovel.



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